

Declaration



0959-1

PATENT

Attorney Docket No. AI 304

IN THE UNITED STATE PATENT AND TRADEMARK OFFICE

In re Application of: )

Hirokazu ARAI et al. )

Serial No.: 10/649,798 ) Group Art Unit:1714

Filed: August 28, 2003 ) Examiner: POULOS, Sandra K.

For: Resin Pulley

Assistant Commissioner for Patents

Washington, DC 20231

Sir:

**RULE 132 DECLARATION**

I, Takeshi TSUDA, do hereby declare the followings:

I am a citizen of Japan, residing at 158-4-305, Kawaraguchi, Kashiba-shi, Nara, Japan, and am the same Takeshi TSUDA who, on December 26, 2005, executed a paper entitled "Rule 132 Declaration" that was filed at the U.S. Patent and Trademark Office along with an Amendment dated December 30, 2005.

I graduated from Electronics Course at Seikyo Senior High School in 1989. I note that the "Rule 132 Declaration" that I executed on December 26, 2005 stated erroneously that I graduated from Industry Course rather than Electronics Course of Seikyo Senior High School in 1989, but this was an inadvertent oversight that I failed to detect due to my limited familiarity with the English language.

I have been employed by Koyo Seiko Co., Ltd. and currently engaged in research activities relating to a resin pulley at Material Technology Research Department of JTEKT Corp.; and



I am a joint inventor of the invention disclosed and claimed in the subject application, knowing an Office Action dated March 29, 2006 was issued for the present invention noticing the claims of the subject application was rejected under 35 U.S.C. 103 as being unpatentable over JP2003-172433 and JP06-322232 in view of Asai et al. and Isutsumi et al.

Experiments shown below were performed by myself or under my supervision in order to establish that the resin pulley of the present invention having a limited content of a reinforcing fiber to not more than 40% by weight and a limited content of an inorganic powder to not less than 20% by weight has a superior characteristic, which is not found in the prior arts.

<<Experiment>>

<Producing Samples>

(Sample 1)

The following components were mixed by a Henschel mixer, a mixture obtained was kneaded by a heat roll heated at 85°C into a sheet shape, and was then ground, to produce a resin composition.

Table 1

Component	Wt%
Resol type phenol resin (*1)	58
Spherical silica powder (*2)	5
Glass fiber (*3)	30
Fluororesin powder (*4)	2
Pigment, Release agent, etc	5

(\*1) number average molecular weight was 800

(\*2) average particle diameter was 20  $\mu$ m, and Mohs hardness was 7 to 8

(\*3) average fiber diameter was 13  $\mu$ m, and average fiber length

was 250  $\mu\text{m}$

(\*4) average particle diameter was 5  $\mu\text{m}$ , and RUBRON® L-2 manufactured by Daikin Industries, Ltd.

In addition, the number average molecular weight of the resol type phenol resin was measured by charging a high-speed liquid chromatograph [HLC-802A manufactured by Tosoh Corporation] with TSK-Gel Column G3000H8 ( $\times 1$ ), G2000H8 ( $\times 2$ ), and G1000H8 ( $\times 1$ ) as columns.

A mold was prepared having a cavity corresponding to a disk-shaped test specimen of 120mm in diameter and 3mm in thickness determined in "Plasitcs-Determination of resistance to wear by abrasive wheels" in Japanese Industrial Standards JIS K 7204: 1999 (in conformity to ISO 9352).

The mold was set in an injection molding machine and was heated at 170°C, and the resin composition was supplied to a hopper of the injection molding machine.

The mold was clamped, and then the resin composition melted and kneaded in the cylinder was injected into the cavity to fill the cavity therewith, and cured. Thereafter, the resin composition was took out from the mold and cooled to produce the disk-shaped test specimen.

(Samples 2 to 6)

Disk-shaped test specimens were produced in a same manner as Sample 1, except that contents of resol type phenol resin, spherical silica powder, and glass fiber in each sample are set into values shown in Table 2.

<Wear resistance test>

Based on the wear resistance test described in JIS K 7204: 1999, a wear resistance of the resin compositions in each sample was evaluated by measuring an amount of wear dust produced when

the test specimens of Samples 1 to 6 were worn out. The measurement conditions are as follows:

Rotating Speed of Test Specimen: 60rpm

Load: 9.8N

Number of Rotation: 1000

Abrasive Wheel: CS-17

The sample production and the wear resistance test were performed three times for each sample, respectively. With respect to a wear loss, an average thereof was determined. The results are shown in Table 2 and Fig. 1.

Table 2

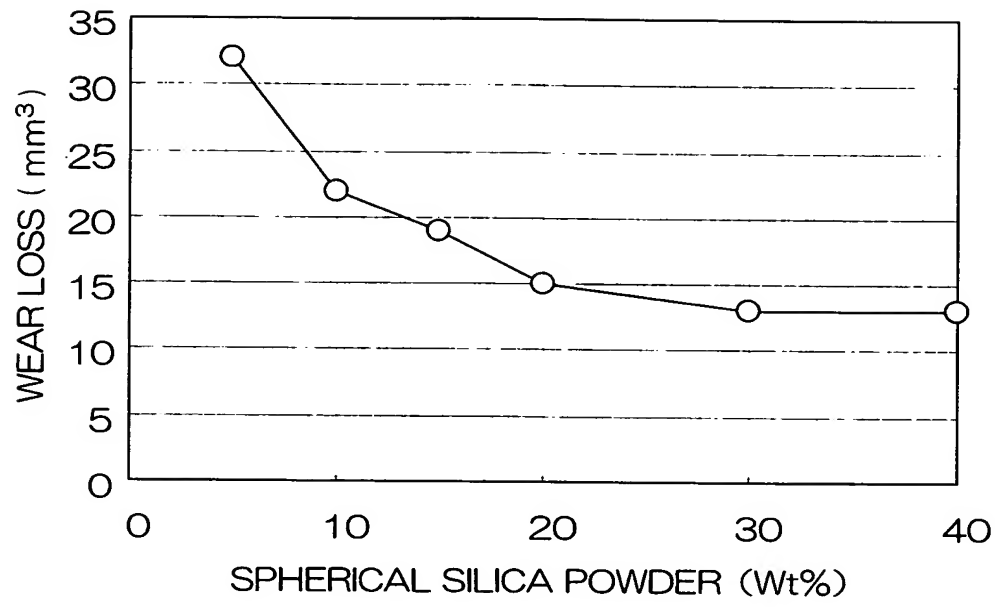
		Sample Nos.					
		1	2	3	4	5	6
(Wt%)	Resol type phenol resin	58	53	48	43	33	23
	Spherical silica powder	5	10	15	20	30	40
	Glass fiber	30	30	30	30	30	30
Wear loss (mm <sup>3</sup> )	First	31	21	20	15	12	12
	Second	32	22	19	15	13	13
	Third	34	23	18	16	14	14
	Average	32	22	19	15	13	13

Table 2 and Fig. 1 confirms that when the content of the inorganic powder is in the range not less than 20% by weight, the wear loss is substantially constant within the range not more than 15mm<sup>3</sup>, while the wear loss increases abruptly when the content is less than 20% by weight.

<<Conclusion>>

The results of the experiments confirms that when the

FIG. 1



content of the reinforcing fiber is not more than 40% by weight in order to obtain a resin pulley restraining a belt attaching property and having a high wear resistance, the content of the inorganic powder must be less than 20% by weight.

<<Accompanying document>>

Fig. 1

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Date: 23/08/2006 By: Takeshi Tsuda  
Takeshi TSUDA